



Agriculture  
Canada

Publication 1886/E

# DLS and Arcott sheep New Canadian breeds



Canada

Printed with the financial support of the following:  
Nova Scotia Department of Agriculture and Marketing  
Ministry of Agriculture and Food  
Canadian Sheep Breeders Association  
Société des éleveurs de moutons de race pure du Québec  
Ministère de l'Agriculture, des Pêcheries et de l'Alimentation  
New Brunswick Agriculture  
Alberta Agriculture

# **DLS and Arcott sheep New Canadian breeds**

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**Agriculture Canada 1886/E**

available from

Communications Branch, Agriculture Canada  
Ottawa, Ont. K1A 0C7

© Minister of Supply and Services Canada 1992  
Cat. No. A63-1886/1992E ISBN 0-662-19920-0  
Printed 1993 5.5M-03:93

Produced by Research Program Service

Également disponible en français sous le titre  
*Moutons DLS et Arcott : nouvelles races canadiennes*

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## **Foreword**

Sheep currently available in Canada were brought from Europe by the early settlers or were imported later from the United States, the United Kingdom, France, and the South Pacific. Although these imported sheep were exposed to types of management different from those to which they had been accustomed, the animals survived and thrived in Canada. In the early 20th century, sheep farmers were greatly interested in acquiring new breeds better adapted to Canadian conditions. The Canadian Corriedale was developed in Alberta, followed by the Romnelet. In 1965 Agriculture Canada initiated two long-term research programs at Lennoxville and Ottawa. These programs resulted in the development of four new breeds of sheep: Dorset–Leicester–Suffolk (DLS) at Lennoxville and Arcott (Canadian, Outaouais, and Rideau) at Ottawa. The DLS breed was released to the sheep industry in 1989. The Arcotts were registered as new breeds with the Canadian Livestock Records Corporation in 1989. They were released to the sheep industry through auction sales and the establishment of nucleus flocks in 1989 and 1990. This publication is intended to familiarize Canadian sheep breeders with the characteristics and attributes of these new breeds.

## **About the authors**

Dr. M.H. Fahmy and Dr. J.N.B. Shrestha are sheep geneticists whose research in sheep breeding led to the development of the DLS and Arcott breeds, respectively.

## REASONS FOR DEVELOPING NEW BREEDS

No less than 5000 breeds and strains of sheep are found in the world. Breed descriptions are available for over 400 of them. So far, none of these is the ideal breed. Breeds superior in prolificacy often produce lambs with poor conformation; those with good carcass and meat qualities are usually less fecund; those that provide a heavy fleece of superior quality mature late and produce lambs with a slow growth rate and low carcass quality; and those that have a long breeding season often lack other important traits. New breeds therefore need to be developed combining superior attributes from various sources.

The main factor limiting the efficiency of meat production is low fecundity. Seven lambs per ewe per pregnancy and a lambing interval of 6 months are believed to be the biological limit for sheep. A big difference can be observed between the biological limit and the current level of performance. To approach this limit, developing new sheep breeds and applying innovative management techniques must be considered. Agriculture Canada believes it is important to develop new Canadian breeds based on modern genetic principles.

In 1965 the sheep industry was in decline. Dr. Camille Bernard, a geneticist at the Lennoxville Research Station, initiated a project to develop a new breed of sheep. This breed, based on Dorset–Leicester–Suffolk and called DLS, would be able to mate at any time of the year, thereby increasing the number of lambings per year, which in turn would increase ewe productivity. Another objective was to develop a highly fertile and prolific ewe that produces rapid-growing lambs with good carcass and meat qualities, thus raising profits. It was hoped that increased profits would encourage breeders to continue sheep farming or expand their operations.

Also in 1965 Dr. Hobart Peters, a geneticist, and Dr. R.S. Gowe were presented with a unique opportunity to develop a “total-system” approach to sheep production. New facilities at the Central Experimental Farm resulted in a proposal to try intensive production in a controlled environment using new techniques. These techniques included artificial rearing of lambs, the use of high-energy diets, an accelerated lambing system based on controlling the estrous cycle by hormones and day length, artificial insemination, and the use of automated equipment for feeding and handling manure. This technology required developing new breeds capable of performing under intensive management. Developing the Arcott breeds was therefore initiated. Although the Arcott breeds were originally intended to be bred for research, they were released to sheep producers in an effort to stimulate improvement and development of the Canadian sheep industry.

# **DLS BREED**

## **Developmental stage**

### **Choice of breeds**

It was important to choose existing breeds with characteristics that would be desirable in the new breed. Dorset was chosen because of its extended breeding season; Border Leicester provided high fertility, prolificacy, and mothering ability; and Suffolk contributed improved growth rate and carcass qualities.

### **Source of animals and formation of DLS**

In October 1965, 24 pregnant Dorset ewes (half polled and half horned) were imported from two flocks in Australia. The ewes were rebred using seven Dorset rams purchased from various flocks in Ontario. In 1966 rams produced from these matings were distributed among Suffolk and Border Leicester breeders in Quebec. Dorset rams were also used to mate a flock of about 100 Border Leicester and 50 Suffolk ewes kept at the Lennoxville Research Station. All Dorset × Border Leicester (DL) and Dorset × Suffolk (DS) ewe lambs and a few ram lambs were purchased from the breeders. In 1967, DL yearling ewes were mated to DS rams and DS yearling ewes to DL rams to produce the first generation of DLS. These matings of 501 DL and 81 DS ewes were repeated for three successive years (1968–1970). The foundation flock of 512 DLS consisted of ewes mated with DLS rams to produce subsequent generations. In 1972 the flock was transferred from Lennoxville to La Pocatière, and over a period of 16 years, six generations of selection were completed and involved 2183 ewes.

### **Management of the flock and selection procedures**

The ability to mate during the summer was the main criterion for selection because the primary objective was to develop a breed with a long breeding season. The ewes and rams were put in mating pens from 1 June to 31 October. Lambing started in late October for the ewes that had a long breeding season. Ewes with a short breeding season lambed in the spring. Each ewe with 2 years of production before selection was assigned a date-of-lambing index, which measured the number of days between lambing date and 1 January. Ewes lambing before 1 January were given a positive index; those lambing after 1 January were given a negative index. The sum of the two indexes gave the total date of lambing index. Rams used for mating were born to ewes with the highest index. The best 50% of ewes according to their index were kept to produce a third lambing. The flock was maintained at about 500 ewes (200 lambing for the first time, 200 for the second time, and 100 for the third time). Each year 200 ewe lambs were kept for replacement, 100 to replace those culled after a second lambing and 100 for those that lambed for the third time.

During the early generations of selection the outward appearance of the animals was ignored. Animals with horns or a colored fleece were tested for genetic merit in early mating. However, in later generations, special attention was given to appearance, and so animals with horns, color, wool in the face, and an appearance not conforming to the DLS type, as illustrated in the photographs, were eliminated. As a result, DLS sheep have acquired a distinctive appearance, different from that of the three ancestral breeds.

## Description

### Physical appearance

#### *Color*

- Completely white, though a few pigmented spots on the nose or mouth are tolerated.
- Animals with colored heads or legs are ineligible for registration.

#### *Head*

- Medium in size, with a tendency to be relatively wide between the ears.
- Face clear of wool.
- Eyes prominent and bright.
- Ears erect, covered with short hair, and free from pigmentation.

#### *Neck*

- Medium in length and width.
- Carries the head high.
- Strongly set on the shoulders.
- No wrinkles.

#### *Body*

- Shoulders broad and full.
- Back straight and wide.
- Belly straight on the underline and in most animals covered with wool.
- Yearlings weigh about 40 kg.
- Mature ewes weigh 60–70 kg, with some up to 80 kg.
- Mature rams weigh 85–105 kg.

#### *Legs*

- Medium in proportion to size.
- Straight feet.
- Strong pasterns.

### *Tail*

- Tail is long, narrow, and always covered with wool.

### *Wool cover*

- Body completely covered with wool, which extends to most of the belly and the legs.
- Animals with the face covered by wool are disqualified for registration.

### *Wool quality*

- Medium grade.
- Great variation in fiber and fleece.

## **Performance**

### **Reproduction**

#### *Sexual maturity*

Ewe lambs reach puberty at 6–8 months old. The animals weigh around 32 kg liveweight at puberty, at an average of 202 days. Ram lambs may reach sexual maturity at about 28 weeks old. Average age at first lambing is 13.2 months.

#### *Breeding season*

Approximately 7–10% of ewes continue to breed for the entire year. In four studies the breeding season averaged 203–226 days. For ewes that exhibit a period of anestral activity during the summer, this period lasts about 130 days. The date of first heat in season usually occurs in the second or third week of August. A large population of ewes lambing for the first, second, or third time following exposure to rams from 1 June to 1 November gave birth on 20 January, 6 January, and 31 December, respectively.

#### *Gestation length*

Length of gestation averages 146 days.

#### *Fertility*

The average fertility rate of mature ewes lambing once a year is 86–98%; 8-month-old ewe lambs exposed to rams have a fertility rate of about 75%. On commercial farms under an accelerated mating program of three lambings in 2 years, mature ewes had a fertility rate of 94.5%.

### *Ovulation rate*

Ovulation ranges between 1.5 and 1.8; in one study 31% of these ovulations did not result in lambs.

### *Length of the estrous cycle*

The interval between mountings was found to average 16.6 days in August (at the beginning of the breeding season) and 17.4 days in May (at the end of the breeding season).

### *Litter size*

Yearlings produce 1.2 lambs; mature ewes, 1.4. In some studies, mature ewes averaged 1.8 lambs. Some DLS breeders reported even higher averages. Lambing triplets are not frequent in DLS, and quadruplets are rare.

### *Lamb mortality*

Of 43 DLS ewes raised over a 5-year period under intensive management, 3% of the lambs were born dead and a further 14% died before weaning. Lamb mortality was 29% for yearlings and 15% for adult ewes under extensive management. In a recent study on yearlings, 11% of the lambs died at birth and 9% from birth to weaning.

### *Performance under accelerated lambing systems*

Ewes lamb every 267 days and are capable of producing 1.4 lambings per year. Ewe productivity per year was calculated at 1.7 lambs weighing 32.1 kg at 50 days.

## **Production**

### *Lamb weights*

Because weight at birth and at weaning is a function of litter size, the table that follows presents these three traits as reported in various studies.

| Birth weight<br>(kg) | Weaning weight<br>(kg) | Weaning age<br>(day) | Litter size |
|----------------------|------------------------|----------------------|-------------|
| 3.90                 | 15.7                   | 50                   | 1.36*       |
| 3.78                 | 18.1                   | 70                   | 1.34        |
| 4.11                 |                        |                      | 1.80        |
| 4.10                 |                        |                      | 1.51        |

\* Yearlings

## *Meat production and carcass quality*

**Dressing percentage** Dressing percentage varies according to slaughter weight and feeding management: lambs fed a high-energy diet and slaughtered at 41 kg dressed about 46%; lambs killed at light weight (23 kg) dressed about 44%; and lambs fed low-energy diets dressed 43%.

**Wholesale cuts** The legs represent 34% of the carcass, and the loin-rack section represents 28%.

**Tissue percentages** Dissecting the twelfth rib into lean, fat, and bone indicated the average percentages for these tissues were, 44.4, 35.5, and 19.2%, respectively.

**Area of loin-eye muscle** This area varies from 14.0 to 11.6 cm<sup>2</sup> for lambs slaughtered at 41–43 kg liveweight.

**Fat cover** Fat thickness over the ribs is associated with the feeding system and slaughter weight. In four studies in which lambs were killed at 41–43 kg liveweight, fat thickness ranged from 3.2 to 6.0 mm.

**Carcass quality** In a study on various breeds, the following comparisons of DLS with Suffolk were obtained for lambs slaughtered at 43 kg liveweight.

| Characteristics             | DLS                  | Suffolk              |
|-----------------------------|----------------------|----------------------|
| Dressing-out                | 43.5%                | 40.7%                |
| Leg                         | 33.4%                | 34.3%                |
| Loin-rack                   | 29.2%                | 28.4%                |
| Shoulder                    | 37.4%                | 37.3%                |
| Kidney fat                  | 2.61%                | 2.74%                |
| Fat thickness over loin eye | 4.1 mm               | 4.0 mm               |
| Area of loin eye            | 14.0 cm <sup>2</sup> | 11.8 cm <sup>2</sup> |
| Lean of twelfth rib         | 42.4%                | 41.1%                |
| Fat of twelfth rib          | 37.6%                | 35.6%                |
| Bone of twelfth rib         | 18.8%                | 22.2%                |
| Intramuscular fat           | 10.5%                | 9.4%                 |

## *Sensory evaluation of meat*

Tenderness, juiciness, and flavor of meat from DLS lambs compare favorably with meat-type breeds such as Suffolk.

## *Feed conversion*

In a 2-year study, lambs fed silage free-choice supplemented with up to 380 g of a grain mixture consumed 6.4 and 6.6 kg of dry matter per kilogram of gain.

### *Milk production*

No studies on milk production were conducted, but the preweaning growth rate of lambs (about 240 g/day) indicates that milk production is adequate. Ewes can raise twins easily.

### *Wool production*

Ewes produced 2.3, 2.4, and 2.8 kg of wool (12–13 months growth) in their first, second, and third shearings, respectively, 61% of which consisted of clean wool. In some studies mature ewes produced up to 3.6 kg, 76% of which consisted of clean wool.

### *Fiber characteristics*

In two studies conducted on wool characteristics, the density of wool fibers was calculated at 1551/cm<sup>2</sup> and 1740/cm<sup>2</sup>. Staple length was about 12 cm and fiber length 15.8 and 15.0 cm. Wool fibers are uniform in length. Average fiber thickness was 26 and 38  $\mu\text{m}$ ,<sup>1</sup> with moderate variability.

## **Specific attributes**

### *Flocking tendency*

Although this attribute was not tested experimentally because the animals were kept in confinement, information from breeders indicates that flocking tendency is well developed. Some evidence also indicates that animals grouped together take time before they mix with other animals.

### *Mothering ability*

Ewes take good care of their young. The low postnatal mortality and fast growth rate of lambs reflect good mothering ability.

### *Presence of horns*

Ewes and rams are hornless. Animals with light horns or scurs are not eligible for registration.

### *Temperament*

DLS are docile and easy to handle.

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<sup>1</sup>  $\mu\text{m}$  = micrometre (25.4  $\mu\text{m}$  = 1 mil = 0.001 inch).

## **Registration of DLS sheep**

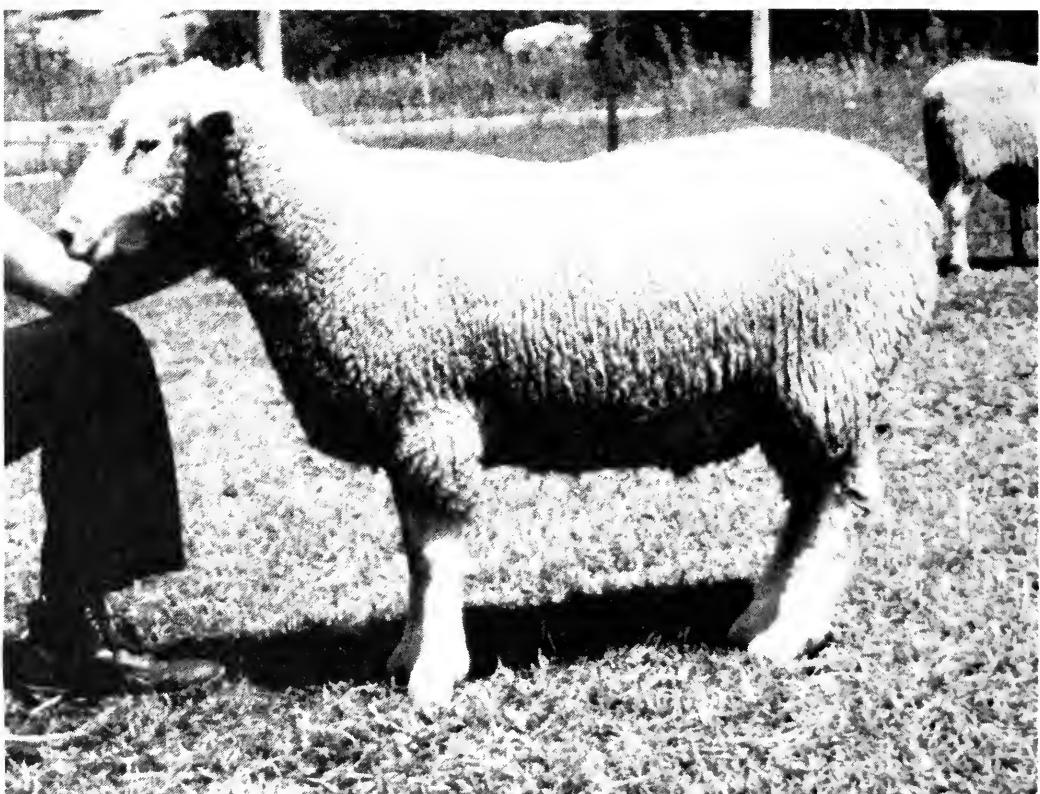
In 1989 and 1990, DLS sheep flocks were examined by a committee of the Canadian Sheep Breeders' Association to identify animals eligible for registration in the Canadian Livestock Records. The foundation of the breed consisted of 208 females and 40 males, raised at five different locations: four breeders and the La Pocatière Experimental Farm, where the breed was developed.

## **Future of the DLS breed**

DLS gained a reputation of being an excellent breed for lamb production under intensive management. Registered DLS animals are now available on four Quebec farms. The flock at Agriculture Canada's La Pocatière Experimental Farm serves to produce improved DLS sheep and to make them available for the industry, until such time as the industry can maintain the breed independently.



DLS ewe



DLS ram

# ARCOTT BREEDS

## Developmental stage

### Original breeds

In 1966 the ewe flock in Ottawa consisted of approximately 160 Shropshire, 190 Suffolk, and 90 OS, a synthetic strain previously developed at Ottawa from Leicester, North Country Cheviot, Romnelet, and Suffolk breeds (each contributed approximately 25%). In the following 3 years 16 Shropshire, 20 Suffolk, and 18 OS rams were used to produce purebred and crossbred offspring.

To increase the flock size and broaden the genetic base, additional ewes were transferred to Ottawa from Agriculture Canada research establishments at Lennoxville and La Pocatière. In 1968, 59 Suffolk ewes were transferred. In the following year 49 Leicester, 24 Suffolk, 13 North Country Cheviot, 9 Canadian Southdown, 8 New Zealand Southdown cross, 1 Canadian Southdown cross, 4 Corriedale cross, 6 Leicester cross, 219 Dorset cross, 12 North Country Cheviot cross, and 34 Suffolk cross ewes were transferred to establish the foundation flock in Ottawa. In 1973 an additional 16 Dorset and 59 Dorset cross ewes were transferred to increase the ewe flock. An additional three Lincoln rams were purchased from the University of Alberta in 1969 to develop the Canadian Arcott.

### Importing exotic breeds

Many exotic breeds were identified as potential sources of germplasm. Only those that met the animal health requirements and that would complement breeds in Canada were imported. In choosing breeds with potential for genetic improvement, researchers emphasized high fertility, year-round breeding, growth rate, carcass quality, milk yield, and production of heavy white fleece. Those chosen for multiplication into the foundation stock were Ile de France, Finnsheep, and East Friesian.

Ile de France, developed in France from a cross between English Leicester and Merino, is characterized by rapid growth rate, heavy-muscled carcass, and a long breeding season. In 1970 and later, Agriculture Canada imported 11 Ile de France rams from Scotland to be incorporated into the Canadian Arcott breed.

Finnsheep were chosen to contribute prolificacy to the two dam breeds, Outaouais Arcott and Rideau Arcott. In November 1966 Agriculture Canada purchased three Finnish Landrace rams imported from Scotland by the University of Manitoba and an additional two yearling rams and eight bred yearling ewes imported from Finland by Finnsheep Ltd.

The East Friesian, a large dairy breed from Germany with a lambing percentage of 200, was chosen to contribute high milk production and prolificacy to Rideau Arcott. In 1970 Agriculture Canada imported five rams of this breed from Scotland.

## Mixing the breeds

Three Suffolk and three Finnish Landrace rams were mated to 240 ewes (approximately 80 each of Suffolk, Shropshire, and OS) in isolated quarantine facilities established at the Centre for Food and Animal Research. At the same time, specific matings required to produce the foundation breeding stock were established by mating rams of East Friesian, Finnish Landrace, Ile de France, and Suffolk to Shropshire, Suffolk, and OS ewes and their crosses.

In 1972 the flock was closed to any introduction of new germplasm. After the quarantine ended in 1974, all sheep were housed in a controlled environment. Sheep were separated into two flocks, A and B, to establish an accelerated lambing program. Breeding was practiced for lambing at 4-month intervals (February, June, and October) under an 8-month breeding cycle. Beginning in 1977, after 5 years of closed breeding, the strains were considered to be new breeds. For the next 4 years, researchers carried out minimal selection to maintain a genetic base.

In 1980 lambs were delivered by hysterectomy—a technique used to produce specific pathogen-free (SPF) swine herds—to establish a disease-free flock. Sheep delivered by hysterectomy were bred to reestablish flocks A and B. Researchers used 50 rams and 400 ewes to develop each Arcott breed.

## Identifying and selecting Arcotts

Arcotts that were originally known as ARC (Animal Research Centre, now called the Centre for Food and Animal Research) synthetic strains 1, 2, and 3 were later named Canadian, Outaouais, and Rideau, respectively. In the selected strains, ewes were mated at a ratio of 10–12 ewes per ram until 1980. Later the ratio was reduced to eight ewes per ram. Mating groups were designed to avoid matings among half-sibs or closely related animals while breeding each ram to a representative sample of ewes from the strain. Rams were used over two consecutive breedings, and ewes were retained for four lambings, based on their ability to produce lambs at 8-month intervals. Usually, any ewe that failed to lamb was culled. However, ewe lambs exposed to rams at 6.5–7.5 months were given a second chance. There was no selection for wool quality or fleece yield. Lambs with severe physical abnormalities were culled. Animals were subjected to the following intensive conditions: exposure to artificial light periods and to hormone treatment, both of which induce out-of-season heat; management to lamb every 8 months; and exposure to a controlled environment. The animals that could not cope with these conditions were automatically disposed of.

The Canadian breed was selected for lean muscle mass and growth rate, based primarily on individual lamb growth. Less emphasis was placed on litter size. After 1984 an index that also included full and half-sib's growth performance was used to select the lambs.

The Outaouais and Rideau breeds were selected primarily on the basis of prolificacy of their dams, with lesser attention to individual lamb growth. After 1984, selection for prolificacy was based on an index of lifetime performance of their dam and maternal and paternal grand dams.

## **Canadian Arcott**

Canadian Arcott are large, rapid-growing and heavy-muscled sheep, developed as a specialized meat-type sire breed for crossing with commercial ewes to produce market lambs.

### **Breed composition**

The primary contributors were Suffolk (37%), Ile de France (28%), Leicester (14%), North Country Cheviot (7%), and Romnelet (6%), with minor contributions of 8% from Shropshire, Lincoln, Southdown, Dorset, East Friesian, Finnsheep, and Corriedale.

### **Description**

#### **Physical appearance**

##### *Color*

- Generally white, although color may appear on the head and legs.

##### *Head*

- Medium in length and width.
- Face white or mottled, free of wrinkles and wool.
- Nose with a prominent bridge of a slightly aquiline cast (Roman).
- Ears medium in length and slightly drooping (semi-pendant).

##### *Neck*

- Medium in length.
- Blends smoothly into the shoulders.
- No wrinkles.

### *Body*

- Shoulders trim, well-rounded, blending smoothly into the body.
- Chest deep and wide, blending smoothly into the body.
- Back strong, straight, and level, carried well out to the dock.
- Loin long, wide, and deep.
- Rump long, full, and well-muscled.
- Mature ewes weigh 75–95 kg.
- Mature rams weigh 80–100 kg.

### *Legs*

- Heavily muscled, extending well into the stifle.
- Heavy-boned, square-set, free of wool, and covered with white or mottled hair.
- Pasterns short and strong.

### *Tail*

- Tail is long, narrow, and covered with wool.

### *Wool cover*

- Body is completely covered with wool, which extends to the belly.

### *Wool quality*

- Fleece is of medium grade.

## **Performance**

### **Reproduction**

#### *Sexual maturity*

Ewe lambs weighing 49 kg conceive at 230 days old.

#### *Breeding season*

Ewes lamb at eight monthly intervals in February, October, and June under an accelerated system.

#### *Gestation length*

Length of gestation averages 147 days.

#### *Age at first lambing*

Ewe lambs can be mated at 7 months to lamb at 1 year old.

## *Fertility*

Under an accelerated system, the fertility rate is 37% for ewe lambs and 70% for adult ewes.

## *Litter size*

Ewe lambs produce an average of 1.3 lambs; adult ewes, 1.9 lambs. About 65% of ewes produce multiple births.

## *Lamb mortality*

Lamb mortality caused by stillbirths and neonatal deaths was 10%. Of the lambs alive at birth, 4% died during artificial rearing (21 days) and a further 3% at 21–91 days old.

## **Production**

### *Lamb weight*

Lambs weigh an average of 4.0 kg at birth and grow 286 g/day from birth to 21 days, at which time they are weaned from milk replacer, and 297 g/day at 21–91 days old. At 118 days old, lambs weigh 37 kg. Total lamb weight per ewe per lambing was 8.4, 18, and 55 kg at birth, 21 days, and 91 days, respectively.

### *Meat production and carcass quality*

Lambs slaughtered at 117–120 days produced carcasses with a large loin-eye muscle of 13.4 cm<sup>2</sup> and adequate fat cover of 6.6 mm. The amount of meat produced was estimated to consist of 44% of the carcass.

### *Wool production*

Ewes produced fleece weighing 2.4 kg for 8 months of growth.

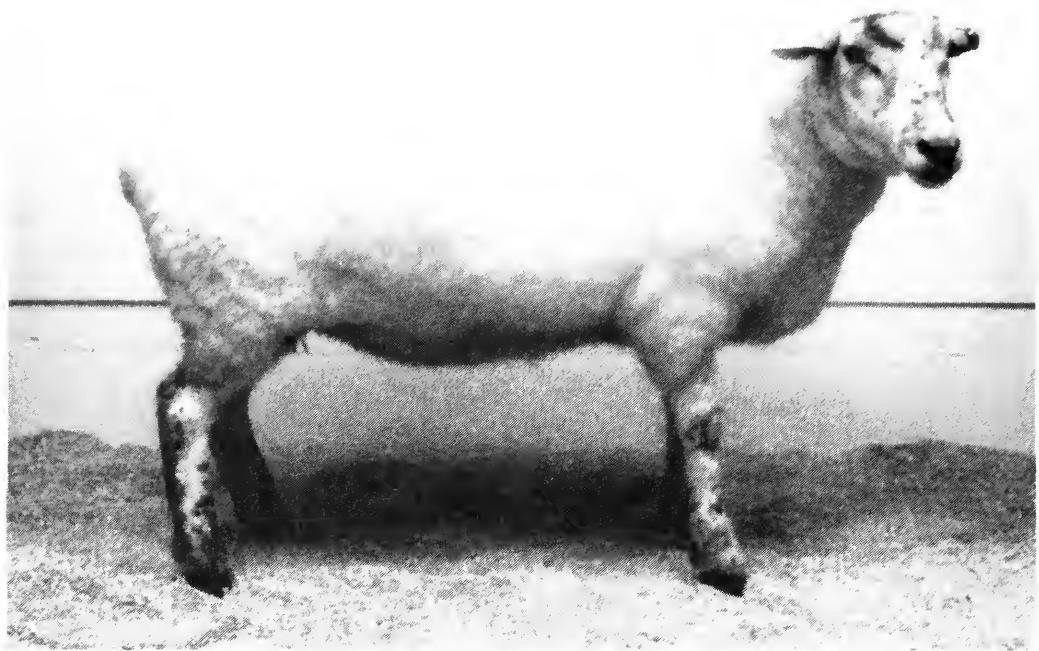
## **Specific attributes**

### *Presence of horns*

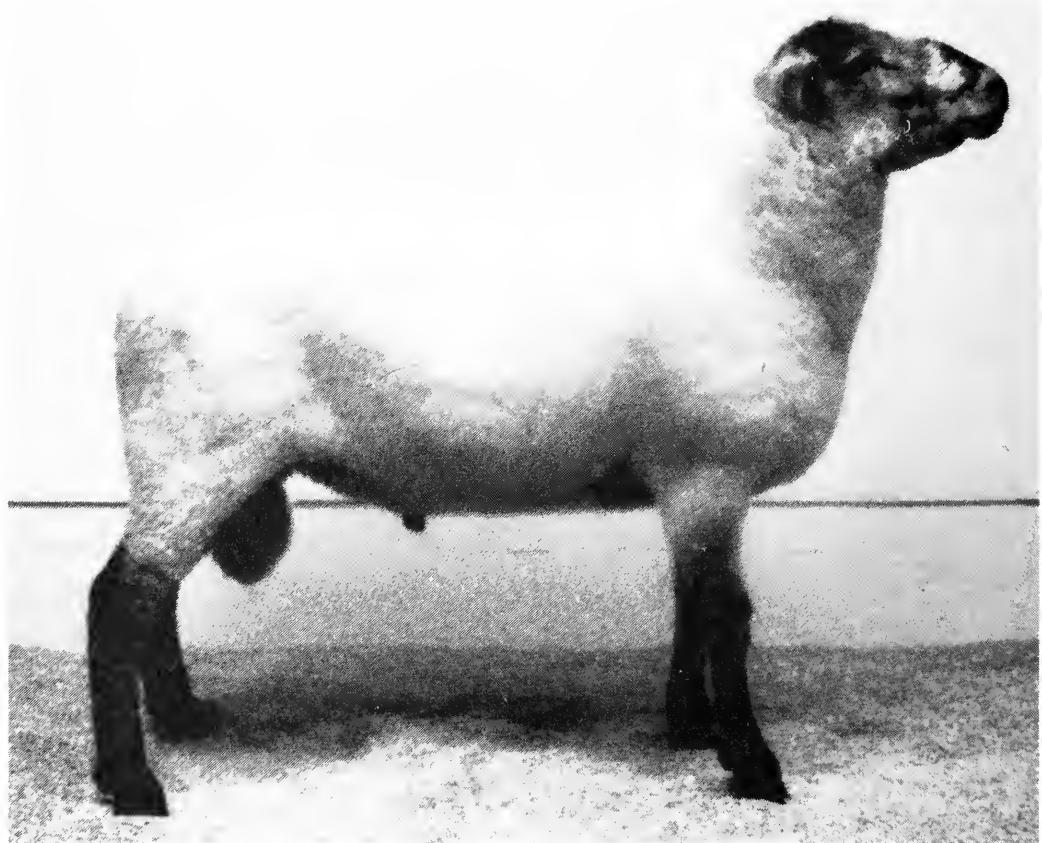
Ewes are hornless, although some rams may have scurs. Animals with horns or scurs are ineligible for registration.

### *Temperament*

Canadian Arcott are docile and easy to handle.



**Canadian Arcott ewe**



**Canadian Arcott ram**

# **Outaouais Arcott**

Outaouais Arcott are a large, rapid-growing, moderately muscled, fecund-type breed, with high productivity under an accelerated lambing system or lambing at eight monthly intervals. Outaouais was developed for producing hybrid ewes for crossing with sires from meat-type breeds.

## **Breed composition**

The primary contributors were Finnish Landrace (49%), Shropshire (26%), and Suffolk (21%), with minor contributions of 4% from Ile de France, East Friesian, Dorset, North Country Cheviot, Leicester, and Romnelet.

## **Description**

### **Physical appearance**

#### *Color*

- Generally white, although color may appear on head and legs.

#### *Head*

- Moderately fine and rather short.
- Face white, tanned, or mottled and free of wrinkles and wool.
- Ears horizontal, short, and thin-textured.

#### *Neck*

- Medium in length.
- Blends smoothly into the shoulders.
- No wrinkles.

#### *Body*

- Shoulders trim, well-rounded, and smoothly blend into the body.
- Chest moderately wide and deep, smoothly blending into the body.
- Back strong, straight, and level, carried well out to the dock.
- Loin medium-sized, with adequate muscling.
- Rump long and level.
- Mature ewes weigh 70–90 kg.
- Mature rams weigh 75–100 kg.

#### *Legs*

- Square-set, fine-boned, adequately muscled.
- Free of wool but covered with white or mottled hair.
- Pasterns short.

### *Tail*

- Tail long, narrow, and covered with wool.

### *Wool cover*

- Body completely covered with wool.

### *Wool quality*

- Fleece of medium grade.

## **Performance**

### **Reproduction**

#### *Sexual maturity*

Ewe lambs weighing 46 kg conceive at 239 days old.

#### *Breeding season*

Ewes lamb at eight monthly intervals in February, June, and October under an accelerated lambing system.

#### *Gestation length*

Length of gestation averages 146 days.

#### *Age at first lambing*

Ewe lambs can be mated at 7 months to lamb at 1 year old.

#### *Fertility*

Under an accelerated system, the fertility rate is 55% for ewe lambs and 80% for adult ewes. Under a conventional system (one lambing per year), adult ewes had an 83% fertility rate.

#### *Litter size*

On commercial or accelerated systems, ewe lambs produced 1.8 lambs; adult ewes, 2.6 lambs. Multiple births constituted 83% of litters. In a study at La Pocatière, 92 ewes produced an average litter of 2.9 lambs, in which 15.2% were single births; 59.8%, twins or triplets; 31.5%, quadruplets or quintuplets; and 4.3%, sextuplets.

#### *Lamb mortality*

Under an accelerated system, 23% of lambs died before 91 days of age; under conventional system, lamb mortality was 27%.

## Production

### *Lamb weight*

Lambs weigh 3.3 kg at birth and grow 271 g/day from birth to 21 days, at which time they are weaned from milk replacer, and 274 g/day at 21–91 days. At 118 days, lambs weigh 35 kg. The table that follows shows ewe productivity in kilograms of lamb produced per ewe per lambing under two systems.

| Ewe productivity per ewe per lambing at | Accelerated system (kg) | Conventional system (kg) |
|---|-------------------------|--------------------------|
| Birth                                   | 8.5                     | 8.6                      |
| Weaning<br>91 days                      | 20*                     | 42†                      |
|   | 66                      | 60                       |

\* Weaned from milk replacer at 21 days.

† Weaned from the ewe at 56 days.

### *Meat production and carcass quality*

Lambs slaughtered at 117–120 days produced carcasses with a large loin-eye muscle of 11.6 cm<sup>2</sup> and adequate fat cover of 5.8 mm. The amount of meat produced was estimated to consist of 43% of the carcass.

### *Milk production*

A milking trial at the University of Minnesota indicated that ewes milked by machine twice daily for about 120 days, following weaning at 30 days, produced 54 L of milk containing 7.3% fat, 6.1% protein, and 4.6% lactose.

### *Wool production*

Ewes produced fleece weighing 2.0 kg for 8 months of growth.

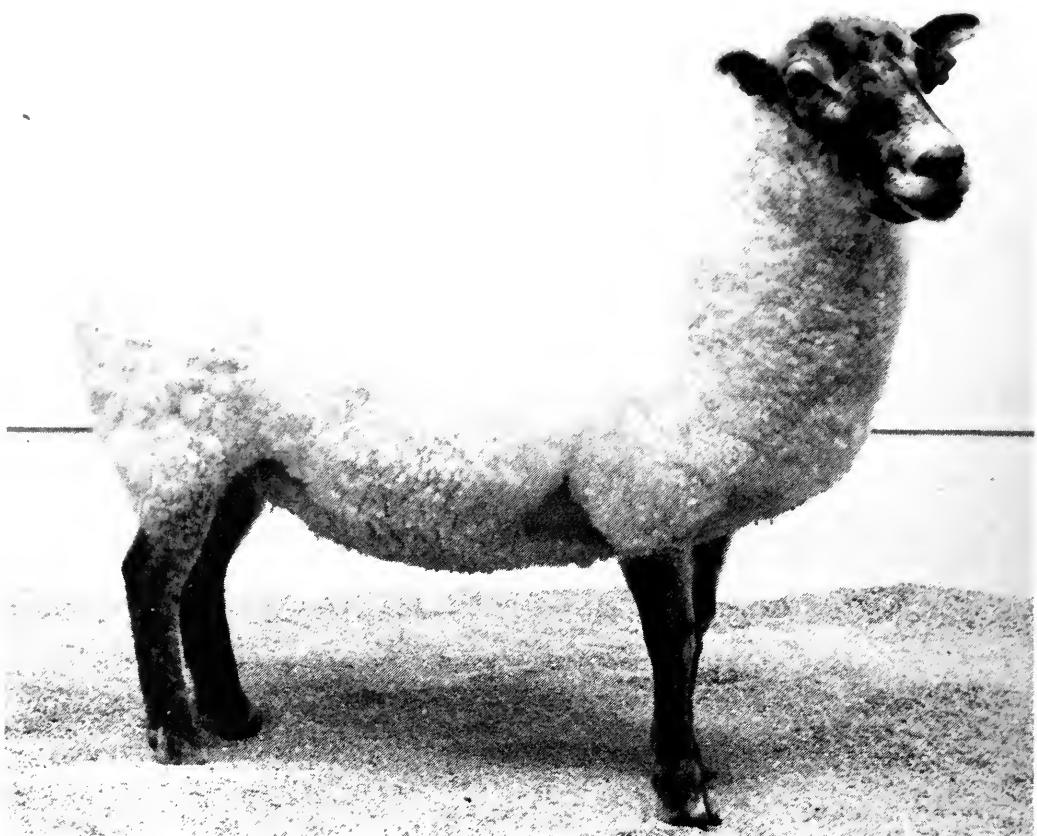
## Specific attributes

### *Presence of horns*

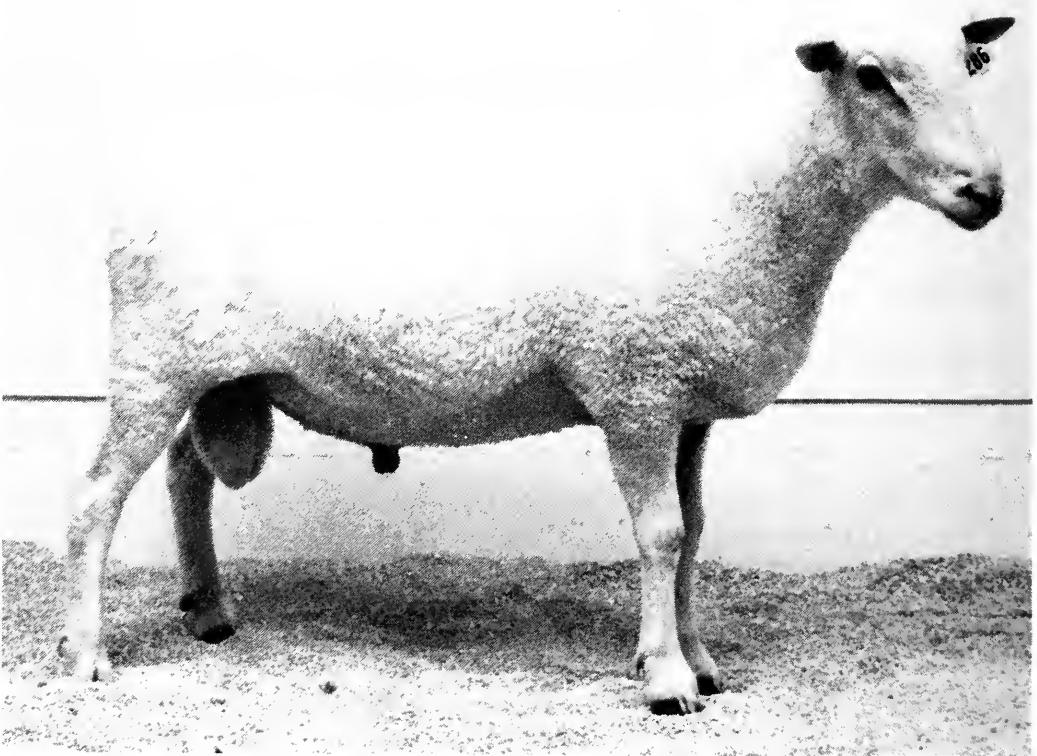
Ewes and rams are hornless, although some rams may have scurs. Animals with horns or scurs are ineligible for registration.

### *Temperament*

Outaouais Arcott are docile and easy to handle.



**Outaouais Arcott ewe**



**Outaouais Arcott ram**

# Rideau Arcott

Rideau Arcott are a large, rapid-growing, moderately muscled, fecund-type breed, with high productivity under an accelerated lambing system or lambing at eight monthly intervals. Rideau was developed for producing hybrid ewes for crossing with sires from meat-type breeds.

## Breed composition

The primary contributors were Finnish Landrace (40%), Suffolk (20%), East Friesian (14%), Shropshire (9%), and Dorset Horn (8%), with a minor contribution of 9% from Border Leicester, North Country Cheviot, Romnelet, and Corriedale breeds.

## Description

### Physical appearance

#### *Color*

- Generally white, although color may appear on the heads and legs.

#### *Head*

- Moderately fine and medium in length.
- Face white or mottled and free of wrinkles and wool.
- Ears horizontal, medium in length, and thin-textured.

#### *Neck*

- Medium in length.
- Blends smoothly into the shoulders.
- No wrinkles.

#### *Body*

- Shoulders trim and well-rounded, blending smoothly into the body.
- Chest moderately wide and deep, blending smoothly into the body.
- Back strong, straight, and level, carried well out to the dock.
- Loin medium in length, with adequate muscling.
- Rump long and level.
- Mature ewes weigh 70–90 kg.
- Mature rams weigh 80–100 kg.

### *Legs*

- Medium-boned, adequately muscled, and square-set.
- Legs free of wool and covered with white or mottled hair.
- Pasterns short.

### *Tail*

- Tail long, narrow, and covered with wool.

### *Wool cover*

- Body completely covered with wool.

### *Wool quality*

- Fleece of medium grade.

## **Performance**

### **Reproduction**

#### *Sexual maturity*

Ewe lambs weighing 47 kg conceive at 228 days old.

#### *Breeding season*

Ewes lamb at eight monthly intervals in February, June, and October under an accelerated lambing system.

#### *Gestation length*

Length of gestation averages 145 days.

#### *Age at first lambing*

Ewe lambs can be mated at 7 months to lamb at 1 year old.

#### *Fertility*

Under an accelerated system, the fertility rate is 57% for ewe lambs and 82% for adult ewes. Under a conventional system (one lambing per year), adult ewes had an 86% fertility rate.

#### *Ovulation rate*

In a recent study at La Pocatière ewes of different ages had two to six ovulations (average 3.25). Ewes superovulated with 800 international units of pregnant mares' serum gonadotrophin (PMSG) had 3–11 ovulations (average 5.67).

### *Litter size*

Ewe lambs produced 1.7 lamb; adult ewes, 2.5 lambs. Adult ewes averaged 2.9 lambs at La Pocatière. Multiple birth accounted for 82% of all litters.

### *Lamb mortality*

Lamb mortality averages 23 and 26% under accelerated and conventional systems, respectively.

## **Production**

### *Lamb weight*

Lambs weigh 3.4 kg at birth and grow 271 g/day from birth to 21 days, at which time they are weaned from milk replacer, and 281 g/day at 21–91 days old. At 118 days old, lambs weigh about 36 kg. The table that follows shows ewe productivity in kilograms of lamb produced per ewe per lambing under two systems.

| Ewe productivity per ewe per lambing at | Accelerated system (kg) | Conventional system (kg) |
|---|-------------------------|--------------------------|
| Birth                                   | 8.8                     | 8.7                      |
| Weaning                                 | 21*                     | 41†                      |
| 91 days                                 | 67                      | 60                       |

\* Weaned from milk replacer at 21 days.

† Weaned from the ewe at 56 days.

### *Meat production and carcass quality*

Lambs slaughtered at 117–120 days produced carcasses with a large loin-eye muscle of 11.7 cm<sup>2</sup> and an adequate fat cover of 5.3 mm. The amount of meat produced was estimated to consist of 43% of the carcass.

### *Milk production*

A milking trial at the University of Minnesota indicated that ewes machine-milked twice daily for about 120 days, following weaning at 30 days of age, produced 77 L of milk containing 6.6% fat, 5.8% protein, and 4.8% lactose.

### *Wool production*

Ewes produced fleece weighing 2.1 kg for 8 months of growth.

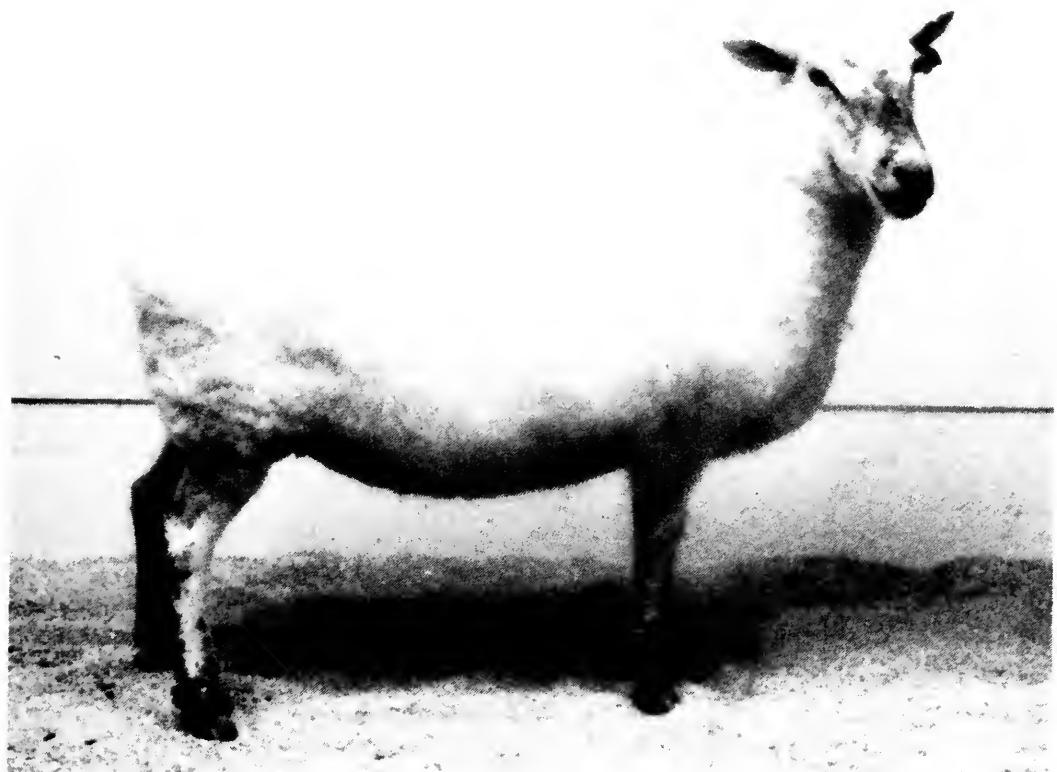
## **Specific attributes**

### *Presence of horns*

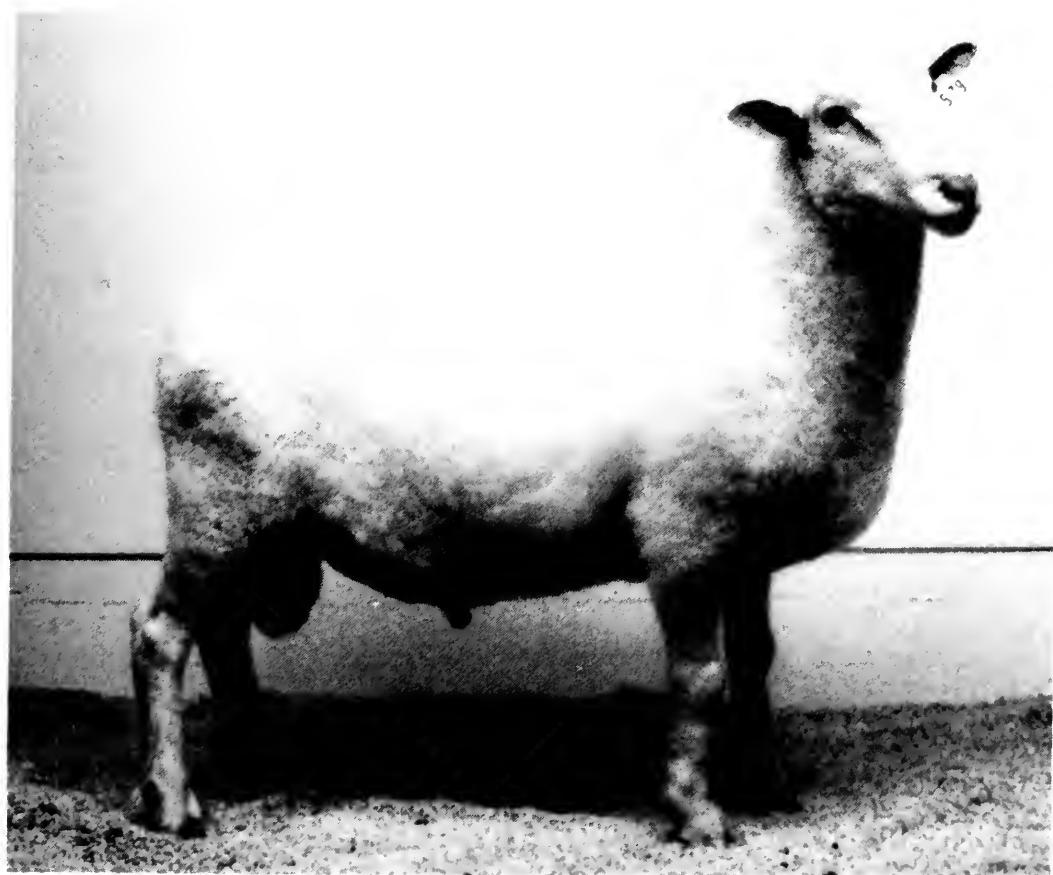
Ewes and rams are hornless, although some rams may have scurs. Animals with horns or scurs are ineligible for registration.

### *Temperament*

Rideau Arcott are docile and easy to handle.



**Rideau Arcott ewe**



**Rideau Arcott ram**

## **Registration and sale of Arcott sheep**

In March 1988, after the Canadian Sheep Breeders' Association approved the Arcott as new breeds of sheep, Agriculture Canada authorized the registration and release of the animals to the industry. Nine nucleus flocks comprising 44 rams and 400 ewes were established for the Canadian Arcott breed in Alberta, Quebec, Ontario, British Columbia, and Saskatchewan; five Outaouais Arcott nucleus flocks comprising 26 rams and 280 ewes in Alberta, Manitoba, and Ontario; and seven Rideau Arcott nucleus flocks comprising 41 rams and 415 ewes in Alberta, Ontario, and Manitoba. The remaining stock of 69 rams and 192 ewes were sold at three auctions held in Nova Scotia, Ontario, and Alberta.

## **Future of Arcott breeds**

The current productivity of adult Outaouais and Rideau breeds has been estimated at three lambs marketed per ewe bred at an 8-month breeding interval. This level of productivity is a conservative figure that could be exceeded in a good commercial operation. The survival of a breed is dependent on its performance and on acceptance by sheep breeders. Sheep breeders with nucleus flocks of Arcott breeds have confirmed the superior productivity of these animals under commercial conditions. More and more breeders are becoming increasingly interested in these new breeds. The demand for breeding stock has been strong, and the nucleus flocks should be capable of meeting future requirements.

The use of Record of Performance (ROP) programs to identify outstanding breeding stock, combined with sound breeding programs and the use of new technology and management strategies, should further enhance the quality of the stock.



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